AMENDMENTS TO THE CLAIMS

1. (Original) An ion doping apparatus comprising:

a chamber;

a discharge section for discharging a gaseous content from within the chamber;

an ion source being provided in the chamber and including an inlet through which to introduce a gas containing an element to be used for doping, the ion source decomposing the gas introduced through the inlet to generate ions containing the element to be used for doping;

an acceleration section for pulling out from the ion source the ions generated at the ion source and accelerating the ions toward a target object held in the chamber; and

a beam current meter for measuring a beam current caused by the accelerated ions,

wherein the beam current is measured by the beam current meter a plurality of times, and if a result of the measurements indicates a stability of the beam current, the ion doping apparatus automatically begins to implant into the target object the ions containing the element to be used for doping.

2. (Original) The ion doping apparatus of claim 1, wherein if each measurement of the beam current falls within a predetermined range, the ion doping apparatus automatically begins to implant into the target object the ions containing the element to be used for doping.

3. (Original) The ion doping apparatus of claim 1, wherein if a variance of the measurements of the beam current falls within a predetermined range, the ion doping apparatus automatically begins to implant into the target object the ions containing the element to be used for doping.

4. (Original) The ion doping apparatus of claim 1 to 3, wherein a single measurement of

the beam current takes place in a period from 50 milliseconds to 1 second.

5. (Currently amended) The ion doping apparatus of ~~claim 1 to 4~~ claim 1, wherein a measurement interval for the beam current is in a range from 100 milliseconds to 1 second.

6. (Currently amended) The ion doping apparatus of ~~any of claims 1 to 5~~ claim 1, wherein the beam current is measured no less than three times and no more than ten times.

7. (Currently amended) The ion doping apparatus of ~~any of claims 1 to 6~~ claim 1, further comprising a control section for controlling at least one of the target object and the accelerated ions so that, if the measurements of the beam current as a result of measuring the beam current with the beam current meter a plurality of times fall within the predetermined range, the target object is irradiated with the ions containing the element to be used for doping.

8. (Original) The ion doping apparatus of claim 7, wherein,

the ion source further includes a filament for releasing thermoelectrons and an anode electrode for performing an arc discharge between itself and the filament to decompose the gas, and

the control section controls the arc discharge so that a constant arc current flows between the filament and the anode electrode.

9. (Currently amended) A semiconductor device comprising: a substrate having an insulative surface; and a crystalline silicon film provided on the substrate, the semiconductor device including a plurality of semiconductor elements each having a source region, a drain region, and a channel region formed in the crystalline silicon film by introducing, by using the ion doping apparatus of ~~any of claims 1 to 8~~ claim 1, the element to be used for doping into the crystalline silicon film as an impurity.

10. (Original) The semiconductor device of claim 9, wherein an average value Ave and a standard deviation σ of impurity concentrations in the respective channel regions of the plurality of semiconductor elements satisfy:

$0.05 \geqq 3\sigma/\mathrm{Ave}$.

11. (Original) The semiconductor device of claim 9, wherein an average value Ave and a standard deviation σ of impurity concentrations in the respective source regions and drain regions of the plurality of semiconductor elements satisfy:

$0.05 \geqq 3\sigma/\mathrm{Ave}$.

12. (Original) The semiconductor device of claim 9, wherein the crystalline silicon film is crystallized by the action of a catalytic metal which promotes crystallization of an amorphous silicon film.

13. (Original) The semiconductor device of claim 12, wherein the amorphous silicon film has a thickness in a range from 25 nm to 80 nm.

14. (Original) The semiconductor device of claim 12, wherein the crystalline silicon film contains the catalytic metal at a concentration equal to or less than 1×10^{16} atoms/cm^3.

15. (Original) The semiconductor device of claim 12, wherein the catalytic metal is at least one type of element selected from the group consisting of nickel, cobalt, palladium, platinum, copper, silver, gold, indium, tin, aluminum, and antimony.

16. (Original) The semiconductor device of claim 10, wherein the catalytic metal is nickel.

17. (Original) The semiconductor device of claim 12, wherein the crystalline silicon film is crystallized by, after introduction of the catalytic metal, at least one method selected from the

group consisting of a heat treatment using a furnace, lamp anneal, and laser irradiation.

18. (Original) An ion doping method comprising the steps of:

decomposing a gas containing an element to be used for doping;

bombarding a target object with ions generated by the decomposition step by accelerating the ions with a predetermined voltage,

wherein, before bombarding the target object with the ions, a beam current caused by the accelerated ions is measured a plurality of times, and if a result of the measurements indicates a stability of the beam current, the ions containing the element to be used for doping begin to be implanted into the target object.

19. (Original) The ion doping method of claim 18, wherein the element to be used for doping is boron or phosphorus.

20. (Original) A method of fabricating a semiconductor device comprising the steps of:

(A) forming an amorphous silicon film on a substrate having an insulative surface;

(B) adding a catalytic metal to the amorphous silicon film;

(C) performing a heat treatment for the amorphous silicon film having the catalytic metal added thereto, to effectuate crystallization and obtain a crystalline silicon film from the amorphous silicon film;

(D) decomposing a gas containing an impurity element, accelerating ions generated by the decomposition, measuring a beam current caused by the accelerated ions a plurality of times, and introducing the ions to the crystalline silicon film if a result of the measurements indicates a stability of the beam current; and

(E) performing a heat treatment for the crystalline silicon film.

21. (Original) The semiconductor device fabrication method of claim 20, further comprising, after step (C), a step of forming an insulating film on the crystalline silicon film,

wherein step (D) comprises the steps of:

(D1) decomposing a gas containing a first impurity element, accelerating ions generated by the decomposition, measuring a beam current caused by the accelerated ions a plurality of times, and introducing the ions to the crystalline silicon film via the insulating film if the measurements of the beam current fall within a predetermined range;

(D2) forming on the crystalline silicon film a pattern composed of a electrically conductive material; and

(D3) decomposing a gas containing a second impurity element, accelerating ions generated by the decomposition, measuring a beam current caused by the accelerated ions a plurality of times, and introducing the ions to the crystalline silicon film by using the pattern as a mask if the measurements of the beam current fall within a predetermined range.

22. (Original) The semiconductor device fabrication method of claim 21, wherein the first impurity element is boron, and the second impurity element is phosphorus.

23. (Original) The semiconductor device fabrication method of claim 20, wherein the catalytic metal is at least one type of element selected from the group consisting of nickel, cobalt, palladium, platinum, copper, silver, gold, indium, tin, aluminum, and antimony.